

White Paper Report

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- PF-50208-11grant
- Improving Climate Control to Preserve Collections of the George Walter Vincent Smith Art Museum, Springfield, Massachusetts
- Heather Haskell
- November 29, 2012

The Springfield Museums received funding from the National Endowment for the Humanities for the improvement of environmental control in the George Walter Vincent Smith Art Museum in Springfield, Massachusetts. The upgrade of the environment within the George Walter Vincent Smith Art Museum has been one of the Springfield Museums' top institutional strategic goals and long-range preservation priorities for more than twenty years. The Museum was built in 1896 to house the 6,000 object collection of George Walter Vincent Smith, a successful entrepreneur and art collector who amassed an eclectic collection of Asian decorative arts, Middle Eastern carpets, European arms and armor, and late-19th century American and Italian paintings. Resembling an Italian Renaissance palazzo, the building features architectural and ornamental motifs that reflect the ideals of the American Renaissance and City Beautiful movements of the late-19th century. Smith oversaw the design and construction of the Museum building as well as the interior spaces, display cases and placement of objects. He served as the Museum's first curator, managing the collection until his death in 1923.

The goals for the improvements included:

- Maintaining and preserving the George Walter Vincent Smith collection.
- Reducing extreme swings in temperature and relative humidity in the galleries during the summer
 - Provide 72 +/- 5 degrees F within the Museum year round.
 - Lower the relative humidity in the summer.
 - Prevent large swings of relative humidity during the spring, summer, and fall.
- Improving the air quality in the galleries.
- Reducing collections care and housekeeping efforts due to particulates from poor air quality.
- Improving the environmental conditions and system reliability for the collections storage vault.
- Having a system that was manageable, sustainable, and energy efficient.

Prior to undertaking the environmental improvement project, the Springfield Museums consulted with numerous museum and building experts to ensure the proposed program would balance the needs of the collections against the thermal capabilities of the building. Through engineering studies, it was determined early on that maintaining the recommended 50% relative humidity, especially during the cold New England winters, would be extremely detrimental to the building envelope. As a result of these studies, the Springfield Museums determined the correct approach would be to manage the environment in the George Walter Vincent Smith Art Museum toward preservation of the collections and museum building rather than control it to unrealistically strict parameters.

The Springfield Museums worked with Harry Grodsky & Company, a privately held full-service mechanical contractor, to develop working plans for the environmental improvements. The scope developed by Grodsky included:

- Removal of almost all of the existing hot water radiators within the Museum (a few could not be removed because of concrete flooring).
- Installation of new four-pipe fan coil units capable of heating and cooling.
- Installation of new insulated chilled water piping within the Museum run parallel to the existing hot water pipes in the basement hallways and first-floor ceiling whenever possible.
- Installation of a new 100-ton chiller in the central heating plant building, located next to the George Walter Vincent Smith Art Museum.
- Installation of new air-cooled condensers behind the building.
- Connection to existing chilled water piping running from the heating plant to the museum that was installed in a prior project.
- Installation of two new 3500cfm air handlers to provide fresh, filtered air through existing vents. Each air handling unit has three stages of filtration (30% efficient pre-filter, a second stage carbon filter and a 95% efficient final filter) to remove particulate and gaseous air contaminants.
- Installation of 2 new self-contained climate control units for the basement vault storage. These units will cool, heat, dehumidify and humidify the storage area.

The project commenced in September of 2011 and by the end of April 2012, the project was substantially complete. In general, the project proceeded according to plan, but there were a few issues that arose during construction including:

- It was discovered that many of the existing radiators did not have shut-off valves, so arrangements were made for the contractors to move from radiator to radiator throughout the museum on Mondays (when the museum is closed to the public) to install critically needed shut-offs valves.
- The original design called for the removal of tongue-in-groove ceiling sections in three first floor gallery spaces to allow for pipe installation above the ceiling to the second floor, followed by the replacement of the tongue-in-groove ceiling. The tongue-in-groove, now almost 120 years old, was found to be too brittle to safely remove and reinstall. The piping was therefore installed just below the ceiling and painted to match. The result was satisfactory.
- The fresh air ducting configuration was redesigned after it was discovered that there was insufficient space where it was originally planned to be installed. Although not as

unobtrusive as originally hoped for, no ducting runs through galleries or other primary public spaces. The solution was satisfactory.

Upon completion of work in the galleries, a total of forty (40) fan coil units had been installed throughout the museum along with two new air handlers. A new chiller was installed as planned in the boiler plant. All galleries were open to the public on March 5, 2012. Since the interim report dated March 29, 2012, the following work was completed:

- The Museum staff and Grodsky developed a punch list of items that were incomplete or incorrect. All items on the punch list have been resolved to the satisfaction of the Museum staff.
- The system balancing, testing, and commissioning has been completed. A copy of the balancing report has been included in the close-out documentation provide by Grodsky.
- All shut-offs valves (for hot and cold water and fresh air intake) have been labeled to correspond with the equipment they shut-off.
- All new water pipes have been labeled.
- Floor plans showing all fan coil units and their associated valves have been created for staff to use in an emergency.
- Final, as-built drawings including mechanicals, primary piping, fresh air ducting, shut-offs, smoke detectors, dampers, switches, etc. have been delivered by Grodsky
- A maintenance plan and schedule for the system has been developed and Grodsky is under contract to provide service for the system.
- Select Springfield Museums staff in facilities, security, and collections have received basic operation, trouble-shooting, and response training.

During the course of the construction project, we learned several lessons including:

- Because of the winter construction schedule, multiple shut downs were necessary to install valves in the former heating system to allow for the isolation of various zones in order to provide heat to the open galleries.
- Sound attenuators were not called for in the original installation plan. They have since been installed in the duct work to lessen the noise of the system.
- A gallery by gallery installation, while it allowed the museum to remain open to the public, was not as time efficient for the contractor.

Because of a staffing change which occurred after substantial completion of the project but which required the replacement of Project Director Wendy Stayman to Heather Haskell, the Springfield Museums asked the engineering consulting firm of Landmark Facilities Group, Inc. to review the completed project and confirm that the program goals had been met. Landmark Facilities Group reviewed sample temperature and relative humidity charts for the summer of

2012 and found that the environmental stabilization goals for the project have been achieved. Because of the temperature stabilization and the resulting positive effect on relative humidity, collections that were removed from the building or placed in storage to protect them from the environmental extremes of the building are now able to be placed back on view. These collections include Smith's impressive collection of American paintings and his eclectic collection of furniture. Once successfully installed, the audience of over 100,000 annual visitors should increase; the immediate impact of the climate modification meant that there was no need to close the museum at any point in the summer due to extreme heat and thus resulted in increased visitor satisfaction.

The grant award and successful completion of the project has been publicized in the regional media, museum publications, business publications, and on the Springfield Museums website. Based on the success and momentum of this essential project, the museums will now focus on the reinterpretation and reinstallation of this important collection and museum. The Springfield Museums received a planning grant from the National Endowment for the Humanities to convene a panel of experts and scholars to help provide direction for the proposed implementation. This panel met over two days in early November; the result will be a vision and plan for the building and collections which will serve as a document to secure the necessary funding to complete the interpretation project.

\$250,000 in additional support for the project has been received from the Cultural Facilities Fund, a State grant offered through the Massachusetts Cultural Council. The remaining costs will be matched from the general operating budget. Grodsky has agreed to allow term-out of payments over 3 years for the remaining cost of the project. The Springfield Museums will be intensifying fund-raising efforts to support the costs of other related repairs, building expenses and reinterpretation of the galleries.

The Springfield Museums staff looks forward to sharing our experiences with our colleagues in the museum field.